

THE COLORS OF BUGS

Two papers by Leroy S. Palmer and Harry H. Knight on the colors of bugs have recently appeared in the "Journal of Biological Chemistry" (Vol. LIX, No. 2, March, 1924, pp. 443-449; pp. 451-455). These authors, after a chemical study, conclude that "the yellow and red colors seen in the hypodermis of the stink-bug, *Perillus bioculatus* (Fab.), are due largely to carotin which is derived from the food; namely, chiefly the lymph of the potato beetle, *Leptinotarsa decemlineata* (Say)," and state that the lymph of the potato beetle is colored entirely by carotin, the concentration in fresh lymph being as high as that found in fresh green leaves. Carotin has been defined as a ruby red crystalline substance found in the chromoplasts in various plants especially the carrot.

The authors made chemical examinations of the red pigment in other bugs and found that it was not limited to one type of substance but that "water soluble pigments appear to be more common than carotin." They report that the vermilion color of the aphid *Tritogenaphis rudbeckiae* (Fitch) is due chiefly to an anthocyanin-like pigment although small amounts of carotin are present. Anthocyanin is a coloring matter found in the cell sap of many plants and is red in the presence of acids. The red color of the red and black plant-bugs *Leptocoris trivittatus* Say, *Lygaeus kalmii* Stal, *Lopidea staphyleae* Kngt., *Coccobaphes sanguinarius* Uhler and the assassin-bug *Eulyes illustris* Stal was found to be due to a flavone-like pigment. Flavone is the parent substance of a large number of yellow dyestuffs.

Palmer and Knight state that it is difficult to "understand how environment can cause a permanent modification of an insect color pattern involving an animal pigment which is derived from the food, and which is subject to fundamental physiological processes of the protoplasm without first causing a permanent modification of the processes to which the derived pigment is subject" and believe that the claim that red pigment in insects can be so changed and the changes become inheritable loses weight in view of the findings that the pigment is likely to be one of the previously mentioned substances derived from the food.

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